IN THE CLAIMS:

Please **AMEND** claims 42, 49, 50, 52, 53 and 55 as follows:

1. (ORIGINAL) A determining method of movement sequence for determining an order of measurement of a plurality of measurement target areas, which is executed prior to an alignment step in which while the plurality of measurement target areas provided on a substrate are successively moved into a preset measuring area of a measuring system, positions of the respective measurement target areas moved into the measuring area are measured, thereby achieving alignment between a transfer position of a pattern of an original plate and each chip area on the substrate,

said determining method of movement sequence comprising an arithmetic step of obtaining a solution of a most preferable movement sequence with respect to an overall movement time between said plurality of measurement target areas, by using a predetermined search technique, said arithmetic step comprising:

a first step of generating a group including a plurality of executable movement sequences out of a group of movement sequence candidates, each indicating a measurement order of said plurality of measurement target areas; and

a second step of selecting a movement sequence that can accomplish a movement operation between said plurality of target areas in the shortest time, out of said group generated.

2. (ORIGINAL) The method according to claim 1, further comprising a pre-step carried out prior to said arithmetic step, said pre-step being a step of producing a movement time management table in which for each of said plurality of measurement target areas, a movement time is recorded as a time necessary for movement of the target area of interest from a position thereof at the time of completion of position measurement of either one of said plurality of measurement target areas into said measuring area of the measuring system.

3. (ORIGINAL) The method according to- claim 2, wherein said movement time management table includes such information that for a pair of measurement target areas selected out of said plurality of measurement target areas, after completion of the position measurement of one measurement target area selected, the other measurement target area selected is prohibited from moving from a position thereof at the time of completion of the position measurement of the one measurement target area selected into said measuring area of the measuring system.

4. (ORIGINAL) The method according to claim 1, wherein said search technique includes at least one of a method based on operations-research technique, an evolutionary computation method, and a combination thereof.

5. (ORIGINAL) The method according to claim 4, wherein said method based on operations-research technique includes at least one of a linear programming method, a Lin and Kernighan's approach, and a k-OPT method.

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6. (ORIGINAL) The method according to claim 5, wherein said linear programming method is a method arranged in such a manner that when there exist plural near solutions to the best solution of a movement sequence to be obtained, a plurality of good solutions are generated by recomputation with change in a method for selecting one specific solution or with change in a search start point and a most preferable, good solution with respect to the overall movement time between said plurality of measurement target areas is selected out of the plurality of good solutions thus generated.

7. (ORIGINAL) The method according to claim 5, wherein said combination method including said linear programming method is a method arranged in such a manner that, using a plurality of first good solutions obtained by said linear programming method for a movement sequence to be obtained, as initial solutions, a plurality of second good solutions are generated by the Lin and Kernighan's approach or the k-OPT method and a most preferable, second good solution with respect to the overall movement time between said plurality of target areas is selected out of said plurality of second good solutions thus generated.

8. (ORIGINAL) The method according to claim 1, wherein said search technique obtains a solution of a most preferable movement sequence with respect to the overall movement time between said plurality of target areas by use of a genetic algorithm, using constraint satisfying solutions generated at random, as initial solutions.

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9. (ORIGINAL) The method according to claim 1, wherein said search technique obtains a solution of a most preferable movement sequence with respect to the overall movement time between said plurality of target areas by use of a genetic algorithm, using solutions obtained by at least one of a linear programming method, a Lin and Kernighan's approach, a k-OPT method, and a combination thereof, as starting solutions.

10. (ORIGINAL) The method according to claim 9, wherein an execution time of said arithmetic step using said genetic algorithm is shortened by improvement in solutions of movement sequences updated on occasion during execution of said genetic algorithm by one of the Lin and Kernighan's approach and the k-OPT method.

11. (ORIGINAL) The method according to claim 9, wherein said genetic algorithm has a mutation operator, said mutation operator having an operator for changing an order of measurement of measurement target areas selected from said plurality of measurement target areas.

12. (ORIGINAL) A determining method of movement sequence for determining an order of measurement of a plurality of alignment marks as becoming measurement targets provided on a substrate, which is executed prior to an alignment step in which while the plurality of alignment marks are successively moved into a preset measuring area of a measuring system, positions of the respective alignment marks moved into the measuring area are measured, thereby achieving alignment between a transfer position of a pattern of an original plate and each chip area on the substrate,

said determining method of movement sequence comprising an arithmetic step of obtaining a solution of a most preferable movement sequence with respect to an overall movement time between said plurality of alignment marks, by use of a predetermined search technique, said arithmetic step comprising:

at least a first step of generating a group including a plurality of executable movement sequences out of a group of movement sequence candidates, each indicating a measurement order of said plurality of alignment marks; and

a second step of selecting a movement sequence that can accomplish a movement operation between said plurality of alignment marks in the shortest time, out of said group generated.

13. (ORIGINAL) The method according to claim 12, further comprising a pre-step carried out prior to said arithmetic step, said pre-step being a step of producing a movement time management table in which for each of said plurality of alignment marks, a movement time is recorded as a time necessary for movement of the alignment mark of interest from a position thereof at the time of completion of position measurement of either one of said plurality of alignment marks into said measuring area of the measuring system.

14. (ORIGINAL) The method according to claim 13, wherein said movement time management table includes such information that for a pair of alignment marks selected out of said plurality of alignment marks, after completion of the position measurement of one alignment mark selected, the other alignment mark selected is prohibited from moving from a position thereof at the time of completion of the position measurement of the one alignment mark selected into said measuring area of the measuring system.

15. (ORIGINAL) An alignment apparatus for successively measuring positions of a plurality of alignment marks as becoming measurement targets provided on a substrate and performing alignment between a transfer position of a pattern of an original plate and each chip area on the substrate by use of a statistical arithmetic method based on information of the positions of the respective alignment marks obtained, said positioning apparatus comprising:

a measuring device for measuring each of the positions of said plurality of alignment marks;

a moving device for effecting relative movement between said plurality of alignment marks and a measuring area of said measuring device;

an arithmetic section for generating a group of a plurality of executable movement sequences out of a group of movement sequence candidates, each indicating a measurement order of said plurality of alignment marks, and selecting a movement sequence that accomplishes a movement operation between said plurality of alignment marks within the shortest time, out of said group generated; and

a control section for controlling said moving device so as to successively move said plurality of alignment marks into the measuring area of said measuring device, according to a solution of the movement sequence obtained by said arithmetic section.

16. (ORIGINAL) The apparatus according to claim 15, further comprising a memory for storing a movement time management table in which for each of said plurality of alignment marks, a movement time is recorded as a time necessary for movement of the alignment mark of interest from a position thereof at the time of completion of position measurement of either one of said plurality of alignment marks into said measuring area of the measuring device.

17. (ORIGINAL) The apparatus according to claim 16, wherein said movement time management table stored in said memory includes such information that for a pair of alignment marks selected out of said plurality of alignment marks, after completion of the position measurement of one alignment mark selected, the other alignment mark selected is prohibited from moving from a position thereof at the time of completion of the position measurement of the one alignment mark selected into said measuring area of the measuring device.

18. (ORIGINAL) The apparatus according to claim 15, wherein said arithmetic section executes a search technique of at least one of a method based on operations-research technique, an evolutionary computation method, and a combination thereof.

19-41. (PREVIOUSLY CANCELLED)

42. (CURRENTLY AMENDED) A mark detecting method of sequentially detecting a plurality of areas to be detected on a substrate by using a detecting device having a predetermined detecting field, said method comprising:

a determining step of determining an order for positioning each of the areas to be detected into the predetermined detecting field by using at least one of a Nearest Neighbor method, a Lin and Kernighan's approach, a k-OPT method, an evolutionary computation method and a combination thereof; and

a movement step of moving the substrate so as to sequentially position each of the areas to be detected into the predetermined detecting field in accordance with the order determined in said determining step.

43. (PREVIOUSLY ADDED) The method according to claim 42, wherein the order determined in said determining step is a solution of a most preferable movement sequence, based on an overall movement time between the areas to be detected.

44. (PREVIOUSLY ADDED) The method according to claim 43, wherein said determining step comprises:

a first step of generating a group including a plurality of executable movement sequences out of a group of movement sequence candidates each indicating a visiting order of the areas to be detected; and

a second step of selecting a movement sequence that accomplish a movement operation between the areas to be detected in the shortest time, out of said group generated in said first step.

45. (PREVIOUSLY ADDED) The method according to claim 42, wherein the evolutionary computation method includes a genetic algorithm.

46. (PREVIOUSLY ADDED)The method according to claim 42, wherein the operations research technique includes at least one of a linear programming method, a Lin and Kernighan's approach, and a k-OPT method.

47. (PREVIOUSLY ADDED) The method according to claim 42, wherein each of the areas to be detected has an alignment mark.

48. (PREVIOUSLY ADDED) The method according to claim 47, wherein a plurality of shot area are provided on the substrate, each of the alignment marks in the areas to be detected is associated with one of the shot areas, and each of the shot areas has ones of the alignment marks in the areas to be detected.

49. (CURRENTLY AMENDED)) A method of exposing a predetermined pattern onto each of a plurality of shot areas on a substrate, said method comprising:

a detecting step of sequentially detecting a plurality of areas to be detected on the substrate by using a detecting apparatus having a predetermined detecting field, each of the areas to be detected having an alignment mark, said detecting step comprising:

a determining step of determining an order of positioning each of the areas to be detected into the predetermined detecting field by using at least one of a Nearest Neighbor method, a Lin and Kernighan's approach, a k-OPT method, an evolutionary computation method and a combination thereof ~~of~~; and

a movement step of moving the substrate so as to sequentially position each of the areas to be detected into the predetermined detecting field in accordance with the order determined in said determining step; and

a transferring step of controlling a position of the substrate, based on the detected results in said detection of alignment mark, and sequentially transferring the predetermined pattern onto the shot areas.

27 50. (CURRENTLY AMENDED) A method of manufacturing a device, comprising:

a detecting step of sequentially detecting a plurality of areas to be detected on the substrate by using a detecting apparatus having a predetermined detecting field, each of the areas to be detected having an alignment mark, said detecting step comprising:

C1 a determining step of determining an order of positioning each of the areas to be detected into the predetermined detecting field by using at least one of a Nearest Neighbor method, a Lin and Kernighan's approach, a k-OPT method, an evolutionary computation method and a combination thereof ~~of~~; and

a movement step of moving the substrate so as to sequentially position each of the areas to be detected into the predetermined detecting field in accordance with the order determined in said determining step; and

a transferring step of controlling a position of the substrate, based on the detected results in said detection of alignment mark, and sequentially transferring a device pattern onto the shot areas.

28 51. (PREVIOUSLY ADDED) A mark detecting method of detecting a plurality of measurement marks associated with a plurality of shot areas arranged on a substrate, said method comprising the steps of:

a first step of detecting at least one of a plurality of first measurement marks provided associated with a predetermined shot area out of the shot areas; and

a second step of detecting at least one of a plurality of second measurement marks provided associated with a shot area different from the predetermined shot area, before detecting all of the first measurement marks.

29 52. (CURRENTLY AMENDED) The method according to clam 28 51, further comprising a third step of detecting one or amore remaining first measurement marks which are not detected in said first step, after said second step.

30 53. (CURRENTLY AMENDED) A method of exposing a predetermined pattern onto each of a plurality of shot areas on a substrate, said method comprising:

a detecting step of detecting a plurality of measurement marks provided associated with a plurality of shot areas arranged on a substrate said detecting step comprising:

a first step of detecting at least one of plurality of first measurement marks provided associated with a predetermined shot area out of the shot areas; ~~and~~

a second step of detecting at least one of a plurality of second measurement marks provided associated with a shot area different from the predetermined shot area, before detecting all of the first measurement marks; and

a third step of detecting one or more remaining first measurement marks which are not detected in said first step, after said second step; and

a transferring step of controlling a relative position between each of the shot areas on the substrate and the predetermined pattern, based on the detected results in said detection of alignment mark, and sequentially transferring the predetermined pattern onto the shot areas.

31 54. (PREVIOUSLY AMENDED) A method of manufacturing a device, comprising:

a detecting step of detecting a plurality of measurement marks provided associated with a plurality of shot areas arranged on a substrate, said detecting step comprising:

a first step of detecting at least one of plurality of first measurement marks provided associated with a predetermined shot area out of the shot areas;

a second step of detecting at least one of a plurality of second measurement marks provided associated with a shot area different from the predetermined shot area, before detecting all of the first measurement marks; and

a third step of detecting one or more remaining first measurement marks which are not detected in said first step, after said second step; and

a transferring step of controlling a relative position between each of the shot areas on the substrate and the predetermined pattern, based on the detected results in said detection of alignment mark, and sequentially transferring a device pattern onto the shot areas.

32 55. (CURRENTLY AMENDED) A mark detecting apparatus which sequentially detects a plurality of areas to be detected on a substrate by using a detecting device having a predetermined detecting field, said apparatus comprising:

a determining device which determines an order for positioning each of the areas to be detected into the predetermined detecting field by using at least one of a Nearest Neighbor method, a Lin and Kernighan's approach, a k-OPT method, an evolutionary computation method and a combination thereof; and

a movement device which is electrically connected to the determining device and which moves the substrate so as to sequentially position each of the areas to be detected into the predetermined detecting field, based on the order determined by said determining device.

56. (PREVIOUSLY ADDED) The apparatus according to claim 55, wherein the order determined by said determining device is a solution of a most preferable movement sequence, based on an overall movement time between said areas.

57. (PREVIOUSLY ADDED) The apparatus according to claim 56, wherein the evolutionary computation method includes a genetic algorithm.

58. (PREVIOUSLY ADDED) The apparatus according to claim 56, wherein the operations-research technique includes at least one of a linear programming method, an Lin and Kernighan's approach, and a k-OPT method.

59. (PREVIOUSLY ADDED) The apparatus according to claim 56, wherein each of the areas to be detected has an alignment mark.

60. (PREVIOUSLY ADDED) The apparatus according to claim 59, wherein a plurality of shot areas are provided on the substrate, each of the alignment marks in the areas to be detected is associated with one of the shot areas, and each of the shot areas has ones of the alignment marks in the areas to be detected.

61. (PREVIOUSLY AMENDED) An exposure apparatus that sequentially exposes a predetermined pattern onto each of a plurality of shot areas on a substrate, said exposure apparatus comprising:

a mark detecting apparatus sequentially detecting a plurality of areas to be detected on the substrate by using a detection apparatus having a predetermined detecting field, each of the areas to be detected having an alignment mark, said detection apparatus comprising:

a determining device which determines an order for positioning each of the areas to be detected into the predetermined detecting filed by using at least one of a Nearest Neighbor method, a Lin and Kernighan's approach, a k-OPT method, an evolutionary computation method and a combination thereof; and

a movement device which is electrically connected to the determining device and which moves the substrate so as to sequentially position each of the areas to be detected into the predetermined detecting field, based on the order determined by said determining device; and

a transferring control apparatus which is electrically connected to the mark detecting apparatus and controls a position of the substrate, based on the detected results in the detection of alignment mark by said mark detecting apparatus, and sequentially transfers the predetermined pattern onto the plurality of shot areas.

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39 62. (PREVIOUSLY ADDED) A mark detecting apparatus which detects a plurality of measurement marks associated with a plurality of shot areas arranged on a substrate, said apparatus comprising:

a detecting device that detects at least one of a plurality of first measurement marks provided associated with a predetermined shot area out of the shot areas; and

a control device, electrically connected to said detecting device, that controls said detecting device to detect at least one of a plurality of second measurement marks associated with a shot area different from the predetermined shot area, before detecting all of the first measurement marks.

40 63. (PREVIOUSLY ADDED) The apparatus according to claim 39 62, wherein said control device controls said detecting device to detect a part of the first measurement marks, detect second measurement marks after detecting the part of the first measurement marks, and detect one or more remaining first measurement marks other than the part of the first measurement marks, after detecting the second measurement marks.

41 64. (PREVIOUSLY AMENDED) An exposure apparatus that exposes a predetermined pattern onto each of a plurality of shot areas on a substrate, said exposure apparatus comprising:

a mark detecting apparatus sequentially detecting a plurality of areas to be detected on the substrate by using a detection apparatus having a predetermined detecting field, each of the areas to be detected having an alignment mark, said detection apparatus comprising:

a determining device which determines an order for positioning each of the areas to be detected into the predetermined detecting field by using at least one of a Nearest Neighbor method, a Lin and Kernighan's approach, a k-OPT method, an evolutionary computation method and a combination thereof; and

a control device which is electrically connected to the determining device and controls said detecting device so as to detect a part of the first measurement marks, detect second measurement marks after detecting the part of the first measurement marks, and detect one or more remaining first measurement marks, which are not measured after detecting the second measurement marks; and

a transferring control apparatus which is electrically connected to the mark detecting apparatus and controls a position of the substrate, based on the detected results in the detection of alignment mark by said mark detecting apparatus, and sequentially transfers the predetermined pattern onto the plurality of shot areas.